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Gerardo Ubau

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/801,891 Confirmation No. 3355
Applicant : Shui T. Lai
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TC/A.U. : 3739
Examiner : Michael F. Peffley

Docket No. : DL-06-01CIP-CON-DIV-
CON
Customer No. : 30349

Title: METHOD AND APPARATUS FOR LASER SURGERY OF THE
CORNEA

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Sir:

In response to the Office action of **August 17, 2006**, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-30 (canceled)

Claim 31 (New): A scanning laser device for ophthalmic surgery, the device comprising:

a laser source for generating a beam of laser pulses, each pulse having a Gaussian-like tissue ablation profile;

scanning optics for directing the beam of the laser pulses;

a computer device coupled with the optics for directing each laser pulse to a location on the cornea;

the computer device comprising one or more digital storage media having embedded therein programming code for programming one or more processors to perform certain operations, including:

a first executable program for calculating a pulse deposit pattern by calculating the location of each laser pulse on the tissue based on overlap of the Gaussian-like ablation profile, such that upon ablation according to said calculated pulse deposit pattern, a smooth ablated surface is provided on the tissue; and

a second executable program for directing each of the lasers pulses to locations on the tissue in accordance with the pulse locations provided by the first executable program; and

an eye movement tracking indicator and optics for directing the laser pulses to be deposited to intended locations on a cornea by adjusting one or more optics when the eye moves during the eye surgery, the eye movement tracking indicator and optics comprising:

an eye positional indicator; and

laser beam deflecting optics for deflecting the laser beam to follow the movement of the eye.

Claim 32 (New): A scanning laser device as in claim 31, wherein a diameter of the laser beams is in a range of around 0.01 to 4.0 mm at the cornea.

Claim 33 (New): A scanning laser device as in claim 31, wherein the Gaussian-like tissue ablation profile of the laser pulse includes a non top bead shape, Gaussian shape or a super-Gaussian shape or a combination thereof.

Claim 34 (New): A scanning laser device as in claim 31, wherein the scanning optics comprise at least one galvanometric scanner.

Claim 35 (New): A scanning laser device as in claim 31, wherein the pulse deposit pattern comprises laser pulse deposit locations sufficiently far apart from each other so that the tissue ablation profiles of at least one pair of consecutive pulses have no overlap.

Claim 36 (New): A scanning laser device as in claim 31, wherein the pulse deposit pattern comprises laser pulse deposit locations sufficiently close to each other so that the tissue ablation profiles of at least one pair of consecutive pulses overlap.

Claim 37 (New): A scanning laser device as in claim 31, wherein the first executable program includes:

a first subroutine for calculating an ablation depth per layer of the deposit pattern;

a second subroutine for calculating the number of layers required to ablate total depth of the predetermined shape of corneal tissue; and

a third subroutine for determining an area boundary for each layer of the deposit pattern.

Claim 38 (New): A scanning laser device as in claim 31, wherein the scanning optics for directing each of the laser pulses provide sequential scanning such that each of the laser pulses is deposited in an orderly sequence until the predetermined pulse deposit pattern is scanned.

Claim 39 (New): A scanning laser device as in claim 38, wherein the orderly sequence includes a linear scan, a circular scan, or a spiral scan, or combinations thereof.

Claim 40 (New): A scanning laser as in claim 31, wherein the scanning optics for directing each of the laser pulses provide a random scan sequence such that laser pulses in the predetermined pulse deposit pattern are deposited randomly.

Claim 41 (New): A scanning laser as in claim 31, wherein the eye positional indicator comprises one or more distinct marks placed on the eye, a pupil of the eye, or a sclera of the eye, or combinations thereof.